1. Apparatus for producing a multi-ply, adhesively bonded tissue intermediate product, the apparatus comprising:

A. a rear reel stand and a rear carrier roll above the rear stand, forming the beginning of an upper web path;

B. a forward reel stand and a forward carrier roll above the forward stand, forming the beginning of a lower web path, the upper web path converging with the lower web path at the forward carrier roll;

C. an adhesive applicator system for applying adhesive to the bottom of tissue moving in the upper web path, the adhesive applicator system comprising:

i. an array of spray nozzles positioned at a spray location below and generally transverse to the upper tissue path, and oriented to spray generally upward, toward the bottom surface of the upper tissue, the first location being between the rear and the forward carrier rolls;

ii. an adhesive conduit connected to provide a flow of adhesive to the spray nozzles, and

iii. a pressurized gas conduit connected to provide a flow of gas to the spray nozzles to atomize adhesive flow through the spray nozzles,

D. a pair of nip rolls positioned downstream from the spray head array and the forward carrier roll, the nip rolls being in both the upper and lower tissue paths, the nip rolls forming a nip for compressing the upper and the lower tissue together

E. a winder downstream of the nip for winding up bonded tissue product, the winder being designed to have a running speed within a predetermined range,

the nip being spaced apart from the spray location at least 230 inches, to permit sprayed adhesive to partially but not completely set during travel over that web path distance at speeds in the predetermined range.

V

2. Apparatus for producing a multi-ply, adhesively bonded tissue intermediate product, the apparatus comprising:

A. a rear reel stand and a rear carrier roll above the rear stand, forming the beginning of an upper web path;

B. a forward reel stand and a forward carrier roll above the forward stand, forming the beginning of a lower web path, the upper web path converging with the lower web path at the forward carrier roll;

C. an adhesive applicator system for applying adhesive to the bottom of tissue moving in the upper web path, the adhesive applicator system comprising:

i. an array of spray nozzles positioned at a spray location below and generally transverse to the upper tissue path, and oriented to spray generally upward, toward the bottom surface of the upper tissue, the first location being between the rear and the forward carrier rolls;

ii. an adhesive conduit connected to provide a flow of adhesive to the spray nozzles, and

iii. a pressurized gas conduit connected to provide a flow of gas to the spray nozzles to atomize adhesive flow through the spray nozzles,

D. a pair of nip rolls positioned downstream from the spray head array and the forward carrier roll, the nip rolls being in both the upper and lower tissue paths, the nip rolls forming a nip for compressing the upper and the lower tissue together

E. a winder downstream of the nip for winding up bonded tissue product, the winder being designed to have a running speed within a predetermined range, and

F. a lift mechanism attached to said array of spray nozzles to move said array between a rest position spaced from the upper web path and a an operative position for delivering adhesive to web moving in the upper web path.

3. The apparatus of claim 1 or claim 2 further comprising:

A. a source of adhesive providing a flow of adhesive to the adhesive conduit;

B. a source of pressurized gas providing a flow of gas to the gas conduit;

C. a sensor for sensing the speed of travel of at least one of the tissue webs, the sensor providing a web speed signal to a signal processor;

D. an adhesive flow control system for controlling the flow of adhesive to the spray heads responsive to web speed, the adhesive flow control system including an adhesive flow monitor and an adhesive flow controller connected the signal processor;

the signal processor providing signals to the adhesive flow controller responsive to the web speed signal and the flow monitor signal, whereby spray rate is varied in response to web travel rate.

4. The apparatus of claim 3 further comprising at least one intermediate reel stand and intermediate carrier roll, forming the beginning of an intermediate web path, the intermediate carrier roll being positioned between the rear and the forward carrier rolls.

5. The apparatus of claim 4 in which the array of spray nozzles is a rear array of spray nozzles positioned at least 230 inches from the nip, and the apparatus further comprises a front array of spray heads positioned at a front sprayer location below and generally transverse to the intermediate web path, and oriented to spray generally upward, toward the bottom surface of the intermediate tissue.

6. The apparatus of claim 1 or claim 2 characterized in that the predetermined speed range is a first predetermined range, and the apparatus is positioned to receive webs from web-forming equipment which includes a dryer and a winder operating at a speed within a second predetermined range,

the first predetermined range being fast enough to process the output of the web-forming equipment substantially without backlog or slowing of that equipment.

7. The apparatus of claim 1 or claim 2 in which the adhesive flow control system includes circuitry to control the amount of adhesive flow supplied to the nozzles substantially proportional to the web travel speed, so as to provide a substantially constant overall ratio of dry adhesive per unit area of web at different web speeds.

8. The apparatus of claim 7 in which the adhesive flow control system comprises circuitry to establish at least two phases, a running phase and a transition phase, the web speed changing during the transition phase to or from the running phase the transition phase being substantially slower than the running phase, and the amount of liquid adhesive delivered per minute is substantially proportional to the web speed during both the running phase and the transitional phase.

9. The apparatus of claim 8 in which the signal processor controls the pressure or flow of nozzle atomizing air in response to web speed change between the running and the transition phase.

10. The apparatus of claim 1 or claim 2 comprising multiple nozzles at the first location, the nozzles being positioned in a shower housing which includes a damper that is movable from a first damper orientation that prevents nozzle spray from reaching the moving web and a second damper orientation in which spray reaches moving web.

11. The apparatus of claim 1 or claim 2 further comprising a nozzle purger including a flush water conduit connected to provide flush water to the adheseive flow conduit and to the nozzle.

12. The apparatus of 11 further in which the nozzle purger further comprises a pressurized gas conduit connected via a purge valve between a source of pressurized gas and the flush water conduit, the purge valve being controlled by a controller to shut the valve when flush water is flowing to the nozzle and then to introduce said pressurized gas when flush water flow is complete, thereby purging liquid from the adhesive conduit and from the nozzle.

13. The apparatus of claim 12 in which a single source of pressurized gas provides gas flow both for atomizing the adhesive and for purging liquid.

14. The apparatus of 13 further in which the pressurized gas is pressurized air.